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Effect of Inoculation of Soybean Seed on Yield

Abstract

The soybean, being a legume, has the capacity to form root nodules and to fix nitrogen from the air. Rhizobia bacteria must be present for the soybeans to fix nitrogen. Because of the development of new strains of rhizobia and the new formulations of inoculants, a study was conducted to test whether a seed-applied inoculant, Sow-fast, would increase yield.

Disciplines

Agricultural Science | Agriculture

Effect of Inoculation of Soybean Seed on Yield

David Rueber, farm superintendent

Introduction

The soybean, being a legume, has the capacity to form root nodules and to fix nitrogen from the air. Rhizobia bacteria must be present for the soybeans to fix nitrogen. Because of the development of new strains of rhizobia and the new formulations of inoculants, a study was conducted to test whether a seed-applied inoculant, Sow-fast, would increase yield.

Materials and Methods

The experiment was conducted at two sites. One site had been in a corn – soybean (C-S) rotation for several years, and the soil was Webster clay loam and Nicolet loam. The other site had been in grass (G) since the 1960s and was adjacent to a field that had been in soybeans for several years. The soil at site G was Canisteo clay loam. At the C-S site, there were 22 replications of paired plots with 6–30 in. rows that were 100 ft long. At site G there were 10 replications of paired plots that were 40 ft long with 4–30 in. rows. The variety planted was Pioneer 9234. To improve adhesion, the seeds were lightly moistened before the sterile peat-based rhizobia was mixed with the seed. The plots were planted with a Kinze brush-type planter.

Results and Discussion

Sow-fast treated seed increased yield at both sites (Table 1), but the increases were not significant. Lack of significant yield increase due to inoculations in fields that had previously been in soybeans is consistent with other work done in Iowa. In site G, most of the difference in yields between inoculated and noninoculated plots occurred further away from the edge of the preexisting soybean field. Unfortunately, this was also the area with more variation in stand due to rough ground at planting time. The average of the plots within 20 ft of the soybean field showed little response to inoculation, suggesting that some rhizobia had washed from the adjacent field onto this area.

The site that had been in grass yielded 11 bushels/acre more than the site that had been in a corn-soybean rotation. It is generally recognized that yield robbing, soil-borne diseases become more of a problem as soybeans are grown more frequently on a site.

Acknowledgments

This study could not have taken place without the cooperation of Jim Garvin and Loveland Industries, Inc.

Table 1. Effect of inoculant on yield at Kanawha.

Treatment	Yield (bushels/acre)	
	Site C-S	Site G
Sow-fast	52.0	63.7
Control	51.6	61.5
LSD (P=0.05)	NS	NS